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No. 6

TABLE OF CONTENTS

SPECIAL ARTICLE - Some Comments on Professional Responsibility..... 3

MEDICAL ABSTRACTS

Patterns of Parental Deprivation .. 8
 Flicker as a Helicopter Pilot
 Problem 13

MISCELLANY

Submarine Medicine 15
 Navy Medical Unit Joins Cholera
 Fight in Philippines..... 16
 Letter of Appreciation from
 Japan 16
 Tributes to Admiral Calver..... 17
 New Broadcasting System for
 Civil Defense Emergencies 19
 Historical Note - USNH
 Brooklyn, New York 19

FROM THE NOTE BOOK

USNH Jacksonville Wins
 Ironman Trophy 20
 American College of Surgeons
 Annual Meeting Oct - Nov '63.. 20
 USNH Yokosuka to Host ACP
 Meeting in 1964 20
 Underwater Contact Lenses..... 20

FROM THE NOTE BOOK (Cont'd)

CAPT Vasa Appointed to A. O. F.
 Research Council 21
 Course - Medical Aspects of
 Advanced Warfare..... 21
 Meetings at USNH Oakland 21

DENTAL SECTION

Carcinoma of Oral Cavity 22
 Effects of Local Anesthetics
 on Pulp Tissue..... 23
 Pulp Damage by Induced
 Inflammation 24
 Personnel and Professional
 Notes 24

PREVENTIVE MEDICINE

Cerebrospinal Meningitis in
 Africa 26
 Know Your World 36

RESERVE SECTION

Navy Ensign 1915 Medical
 Program (Cont'd) 38

MEDICAL NEWS LETTER

Vol. 42

Friday, 20 September 1963

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Change of Address

Please forward changes of address for the News Letter to: Commanding Officer, U. S. Naval Medical School, National Naval Medical Center, Bethesda, Maryland 20014, giving full name, rank, corps, and old and new addresses.

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ORIGINAL ARTICLE

Some Comments on Professional Responsibility

By Mr. Loren B. Poush LL. B., Legal Assistant to the Surgeon General,
United States Navy

Over the years, medical officers of the Navy have asked one official or another in the Bureau of Medicine and Surgery the question, "Shall I take professional liability insurance?" To be more accurate the question more often is, "Shall I have malpractice insurance?"

The most recent question received in the Bureau was prompted by an announcement which appeared in an Air Force publication destined for medical officers in the Air Force, and reciting certain elementary truths. The first of these was that members of the uniformed services on active duty are unable to sue the Federal Government under the Federal Tort Claims Act, and that a military patient who has a legal cause of action based on negligence by a military physician or dentist may institute suit only against the individual physician. The observation was accompanied by the information concerning availability of Government counsel who would defend the medical or dental officer suit under these circumstances. The article reported that the Office of the Surgeon General, U. S. Air Force, recommended that every medical and dental officer engaged directly in the care of patients give serious consideration to the purchase of professional liability insurance.

On discussing the professional responsibilities of medical officers of the Navy and considering, in that discussion, the professional liability of such officers, one often encounters the view or impression that the professional responsibility of Navy medical officers has been changed in some significant way. This impression or change seems to be based on the belief that each suit arising from medical practice involving the doctrine of *res ipsa loquitur*, which ends with a judgment unfavorable to the defendant physician or hospital, amounts to an extension or broadening of the application of that doctrine. All physicians seem to be acquainted with the doctrine, if not with its application in specific cases. There is considerable concern with the knowledge that ~~judgments are awarded in increasingly larger sums and tend to be based solely~~ on simple failures in treatment or the recovery of the patient.

What is the truth? It is that Navy medical officers, with a single exception, have not been sued personally since the enactment of the Federal Tort Claims Act in 1946. This particular exception was a suit filed in Baltimore perhaps as long ago as 1950 in a Federal and not a State court by former members, a woman and her husband. The reason which would suggest a personal suit would be known only to the plaintiff. Ultimately, the suit was dismissed with prejudice to the plaintiff (suit could not be filed again) for lack of prosecution. Inability of a member or employee to recover under the Federal Tort Claims Act, however, is due to the provision by Congress of some method for relief under other law and actually does not "strip" a medical officer

of any protection. The simple fact—not a cause for alarm—is that before and after enactment of the Federal Tort Claims Act, a medical officer was and is subject to personal suit in a State court.

The Department of Defense legislative program for the current year formerly had an item to further amend the Federal Tort Claims Act to give all Government employees and officials, including medical officers, the protection which Government motor vehicle operators now have. Motor vehicle operators have this protection by a recent amendment to the Federal Tort Claims Act specifically exempting such persons from suits in State courts. The Bureau favored such an item when discussed in preparation for the Department of Defense program, but insisted that the subject be treated with somewhat more dignity as a matter of professional liability rather than as the epithet of the plaintiff's attorney, "malpractice" protection. In discussions by medical officers and others which occur at institutes or seminars, representatives of the three military services report differing positions with respect to private professional liability insurance.

The Air Force urges private insurance, a view with which the Army disagrees. The Bureau of Medicine and Surgery up to this time has denied the need for private insurance by every medical officer of the Navy. However, the Bureau notes that a medical officer is entitled to peace of mind and if he finds himself practicing medicine at a station where there is poor morale, if he has considerable private wealth with associated reputation, or if he is inclined to be overtly anxious about his professional situation, then he may properly decide, as a private matter, to purchase professional liability insurance. To repeat, this is a private matter, however, and up to the present time the Chief of the Bureau of Medicine and Surgery has not wanted to be in a position of recommending to subordinates the purchase of, and payment of premiums for, commercial liability insurance. Such a recommendation is apparently of doubtful tenability.

Professional responsibility is a serious matter and every medical officer has a personal liability, but there is no evidence in the Navy that the personal hazard to medical officers is greater this year than last, or in the last ten years. It would not seem that lawyers who represent, or have responsibility for, the best interests of physicians serve them best by writing generalities and offering conclusions about the legal doctrines and principles of medical cases. In the first place, if the lawyers and physicians continually discuss judgments in specific cases as having extended the application of the doctrine of *res ipsa loquitur*, or in having extended the responsibility of physicians toward certain guarantees of the efficacy of treatment, or of recovery and the future condition of the patient, the effect is to make the application of the case which is discussed certain, although the case itself may not have done so. In other words, if physicians repeat often enough that a certain case extended the doctrine of *res ipsa loquitur* to spinal anesthesia or extended the principle of assured results of some given treatment, the public generally, and perhaps even the judges, come to entertain this view of the effect of the case, even though the actual judgment failed to do so. For example, there was

a particular case which awarded a judgment of money damages to the plaintiff. The suit was filed after spinal anesthesia for delivery which was followed by some paralysis. The court record indicated that the doctrine of *res ipsa loquitur* played a part and, in accordance with legal practice, an expert, a physician specialized in anesthesia, was called in for testimony to determine the application of the doctrine. The court records also indicated that in the clinical papers there were entries showing administration of spinal anesthesia at two different times when only one time should have been involved. One entry had been ruled out without identification of the person making the interlineations or without evidence of the reason for interlineations. In addition, it appeared that the patient had been given a prescription for anesthetic to be filled by a private pharmacist; when the anesthetic was brought to the hospital by the patient, it was placed in a container with similar anesthetic vials. There was no effort to administer that particular vial to the patient for whom the prescription was filled nor to identify the origin of the vial which was administered preparatory to delivery. Physicians who discussed the case without reading the court record concluded that the doctrine of *res ipsa loquitur* had been applied more stringently so far as the physician was concerned. The judgment, however, probably was based on the standards of practice exhibited by these two indications in the record of treatment.

It is felt that lawyers or physicians who are especially interested in legal matters could be of more assistance to physicians if cases resulting in judgments unfavorable to the physicians were sifted and the type of occurrence which probably led to the judgment were discussed in medical terms, with only the most simple evaluation of what happened in connection with the legal doctrine in the case.

Let us also advert to the careless use of the epithet of the plaintiff's attorney, "malpractice." The use of the term in alluding to every kind of medical misadventure appears to encourage patients to believe that less than favorable cure, recovery, or rehabilitation amounts to inferences of bad faith on the part of the physician, and obscures from the patient (in contemplation of claims against the physician or hospital) the necessity of offering some proof of negligence to make a case. Also, this kind of thing probably obscured from the patient the need to determine what standards of practice should have been followed and whether those standards had been followed.

Black's Law Dictionary (4th ed. 1951) describes "malpractice" as "Any professional misconduct, unreasonable lack of skill or fidelity in professional or judiciary duties, evil practice, or illegal or immoral conduct. As applied to physicians and surgeons, this term generally means professional misconduct toward a patient which is considered reprehensible, either because it is immoral in itself or because contrary to law or expressly forbidden by law. As applied to physicians and surgeons in a more specific sense, it means bad, wrong, or injudicious treatment of a patient professionally and, in respect to the particular disease or injury resulting in injury, unnecessary suffering, or death to the patient, and proceeding from ignorance, carelessness, want of proper professional skill, disregard of established rules or principles, neglect, or a malicious or criminal intent."

A physician's professional liability includes a good deal more than just a responsibility to avoid evil or bad practice. To discuss medical professional liability would be somewhat near the practice of an owner and driver of a motor vehicle who habitually and seriously referred to his liability insurance as drunk driving insurance. One can see that this is not so much a legal matter as a public relations matter between the physician and the layman generally. For this reason, physicians themselves should raise the level of their contemplation and discussion to the more dignified outline of professional liability, and should object vigorously to discussions of "malpractice" by insurers or lawyers who represent them. Such an attitude among physicians may change the trend which physicians now decry as an evaluation by patients of any failure of treatment or recovery as bad practice, or as an extension of legal doctrine which portends judicial translation or a certain result as lump sum damages.

If, at this point, some reader may be concerned with the status of the Department of Defense legislative program and the place of the amendment in relation to the Federal Tort Claims Act in that program, it is reported that the item was ultimately not recommended by the Department of Defense and so is not a legislative item pending before the Congress at this time. It is understood that the Air Force intends to recommend this legislation again in the near future; the Chief of the Bureau of Medicine and Surgery has indicated to the Bureau staff that the Bureau will support such a recommendation and will join with the other military services in an effort to have the item presented to the Congress for consideration next session.

In discussions of professional responsibilities of medical officers and in allusions to the civil liability which may result from fulfilling these responsibilities, some physicians occasionally suggest waivers. It has been observed that a physician in suggesting a waiver sometimes seems to have in mind, not a waiver but a detailed consent under circumstances in which the risks may be greater for a particular patient due to age, poor condition, or some other factor. For example, a patient of great age with cataracts may consider sight recovery by surgery more important than the risk of death. There may be members of the patient's family who are not aware of such physician-patient consideration. The physician will want to establish in some way the patient's desire and election to have surgery notwithstanding an unfavorable prospect. Such a document is no more than the medical consent rather than a waiver and should never be alluded to as a waiver. The term waiver is used as a reference to an administrative transaction which sometimes is sought by management in taking from persons waivers of negligence usually in commercial operations of different types, but also occasionally in medical or hospital business. Waiver of negligence is contrary to public policy and invalid, or usually found to be invalid. It would be undesirable from every professional point of view to ask a patient for a waiver as this simply is the practice of asking someone to sign an agreement to ignore negligent acts or omissions and in the end is given effect only by the ignorant or by those who have high moral concepts with respect to personal promises.

Consents are involved also in research projects. The documentation of the consent should not be carelessly alluded to as a waiver or a waiver of negligence, but the consent should be complete enough to show that the subject of the research has been reasonably well informed concerning risks which will accompany the research.

Professional responsibility for admission of certain patients in other than Government hospitals has been the target of claimants in some cases during the past year or so. Federal hospital responsibilities for admitting patients vary considerably from non-Federal hospital admission responsibilities and are not comparable. This is not to say that there is not professional responsibility with Naval medical officers for admitting or not admitting patients; Naval hospital staffs are subjected to what might be called local patient census atmosphere which, of course, will not be news to anyone. It also will not be news that such an atmosphere has tended to obscure for the professional medical staff in diagnosis, on occasion, some medical facts which have resulted in handling patients who present themselves, or are presented, for admission, with less than the care subsequently indicated as necessary. In this atmosphere, certain impressions may influence diagnosis and management by Navy hospital staff, and include a kind of judicial notice of such things as the tendencies of certain members to malingering during Christmas and New Years holidays.

The Medical Corps generally is apt to have a reputation for being sympathetic in matters other than strictly medical ones; it is not a bad idea to have this reputation. Maintaining such a reputation by a medical officer should not be permitted to the point where an Officer of the Day declines to admit a patient with definite complaints merely to avoid returning the patient to his ship after examination with a report of physical condition which may incidentally show malingering or attempting to malingering. Such a voluntary patient may encounter mild to severe disciplinary action, but it is less common to have a patient who should have been admitted and who did not survive the failure of the staff to recognize him as one who was not malingering.

Medical officers in admission units of naval medical facilities generally observe the practice of retaining, for a reasonable time, those questionable borderline cases which "might go bad," or which are subject to facts complicating the return of the patient in event of worsening condition until need for admission or release becomes apparent. This professional prudence pays in avoidance of complaints or allegations of negligence.

* * * * *

Between 1950 and 1960 epidemics of meningococcal cerebrospinal meningitis struck down hundreds of thousands of Africans, and more than 50,000 died. The disease is curiously limited in its distribution in Africa, being virtually confined to a strip of country 4200 km long and 600 km wide running from the Atlantic to the Red Sea. The existence of this "meningitis belt" appears to be due to climatic factors. —WHO Chronicle 17(7): 256, July 1963

NOTE: Readers are referred to the article on page 26 of this issue.

Patterns of Parental Deprivation

By LT F. A. Schulaner MC USN*. From the Proceedings of the Monthly Staff Conferences of the U. S. Naval Hospital, NNMC, Bethesda, Md., 1962 - 1963.

This report deals with the abuse of children by their parents. Parental deprivation of children is, unfortunately, not an unusual phenomenon in society. This deprivation may take several forms: there may be material or emotional neglect or actual physical abuse. Four patients seen on Tower Six during the past year reflect almost the entire spectrum of the problem.

Our first patient, K—— H——, a 5-months old white girl, was admitted with a swollen right elbow which the parents denied knowledge of. A palpable bony deformity of the distal right forearm and motion restriction of the right elbow were found.

X rays revealed an old fracture of the distal radius and ulna on the right as well as an avulsion fracture of the right humerus. There was also some periosteal elevation on the medial surface of the right tibia and a well healed fracture of the left clavicle. Laboratory studies including calcium, phosphorus, alkaline phosphatase; vitamins A and C levels were all within normal limits. It was noted on the ward that the patient was afraid of male personnel, but responded readily to female attendants. The father was in the process of being discharged from the Navy because of being a transvestite.

This patient clearly represents an example of the "Battered Child Syndrome," recently so well described by Kempe (6). This is certainly not a new problem (13). Early papers described the roentgenographic findings of infantile trauma (2, 9), but only recently has there been an awareness of the parents' role in producing such injuries and a plea to protect the child from such an environment (4, 6).

The true incidence of this problem, of course, is unknown, but in a survey of seventy-one hospitals during a one-year period, 302 children were believed to have had this syndrome; 33 died and 85 had permanent brain injury (6). An editorial in the J. A. M. A. stated, "It is likely that the 'Battered Child Syndrome' will be found to be a more frequent cause of death than such well recognized and thoroughly studied diseases as leukemia, cystic fibrosis, and muscular dystrophy, and it may well rank with automobile accidents and the toxic and infectious encephalitides as a cause of acquired disturbances of the central nervous system."

The home situation of these children is generally poor. Often, parents are of low intelligence, although this is not always the case. Many have psychopathic or sociopathic personalities. The father of our patient certainly had a serious problem. These parents are characteristically immature, impulsive, self-centered, and quick to react with poorly controlled aggressions (6). Often, the attacking parents had themselves been subject to physical abuse from their

* Resident in Pediatrics at the hospital.

parents. This is not surprising since patterns of child-rearing, both good and bad, are passed on from one generation to the next in relatively unchanged form.

The syndrome occurs at any age, but generally the child is under 3 years. An almost constant feature is the absence of any history of trauma or injury. Chronic subdural hematomas with or without skull fractures are frequently found. The fact that no new bone or soft tissue lesions occur while the child is in the hospital adds weight to the proper diagnosis.

The bones tell us a story that the parents are reluctant, and the child too young or too frightened, to tell. Unless there are gross fractures, dislocations, or epiphyseal separations, there may be no signs of bone injury for at least 7 to 10 days. At that time, the characteristic traumatic periostitis may be seen. The periosteum of the infant is quite loosely attached, and even minor injury can produce periosteal stripping with elevation and hematoma formation. When the periosteum has produced enough calcified bone on its internal surface, it becomes visible as a line of increased density paralleling the shaft. If there is a rupture of the periosteum, then there will be marked irregularity of the periosteal new bone formation. The second characteristic lesion is fragmentation in the metaphyseal area. These are more difficult to explain. Possibly, the fracture lines are invisible at the time of injury and become visible as demineralization adjacent to the fracture takes place (9). Jerking and twisting of the limbs can produce this type of injury. Films may demonstrate traumatic changes in several locations in different stages of healing which dramatizes the repetitive nature of the injury.

The next 2 patients present a different manifestation of parental deprivation. D—— and P—— C. —— were referred to this hospital from the Army Hospital, Fort Dix, New Jersey, because of marked retardation of growth and development.

P——, the older was 3 and 1/2 years old. At birth, a segment of atretic ileum was removed at Chelsea Naval Hospital. He did well until 5 months of age when, after an exfoliative rash, he began to have bouts of "diarrhea." Despite this, the patient doubled his birth weight at 6 months, and was 20 pounds at one year, but at this point he slowly began a steady downhill course. At 15 months he weighed 18 pounds, and on admission weighed 17 pounds which is the 50th percentile for an 8-months old; he had a height age of 13 months and a bone age of 18 months. Numerous laboratory studies were negative. There was no improvement following a course of prednisone, and after a gluten-free diet. It was noted that during P——'s brief periods of hospitalization he would gain weight, only to lose it again after discharge. Physical examination revealed a severely malnourished boy with protuberant abdomen. P—— could stand and walk with a wide-based clumsy gait, could eat by himself, would respond to simple commands, but he could not speak intelligibly.

D——, the younger brother, was 2 years old and, apparently, since birth had had intermittent bouts of diarrhea. His early growth was normal, weighing 14 pounds at 7 months, but at one year he weighed 13 pounds. On admission, he weighed 12 pounds which was the 50th percentile for a 2 and 1/2

months old infant. D——'s height age was 10 months and bone age 15 months. A battery of laboratory studies revealed nothing, and a gluten-free diet and steroid therapy were of no help. D—— was even more cachectic than his brother. He had the general appearance of a weazened old man. He could not sit alone, but could sit with support and roll over. He would continually be on his hands and knees and bang his head against the crib sidings. D—— was unable to speak or to hold objects well.

Mrs. C——, the mother, was 26 years old but looked 15 years older. She had four other children: aged 7, 6, 5, and an infant of 5 months. All were apparently well. The parents deposited the two brothers quickly at the hospital and returned only to take them home 2 months later.

The hospital courses of these two patients were strikingly similar. A multitude of laboratory data was negative. The initial chest film of D—— revealed a fracture of the tenth rib on the right. Both children were placed

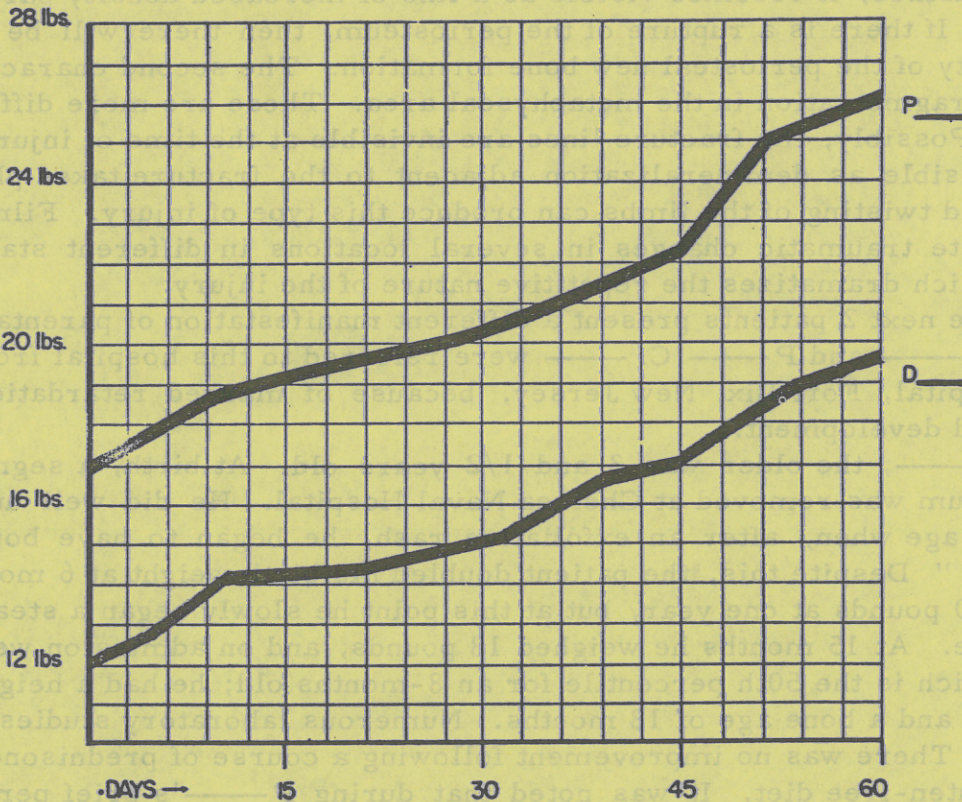


Fig. 1. Weight gain during hospitalization.

on regular diets and gained weight remarkably well (Figure 1). Emotionally and developmentally there was a comparable degree of improvement while they were in the hospital. P——'s walking improved; he spoke more and became toilet-trained. He would respond and seek warmth and affection. He

learned to sit alone, pull himself up to a standing position, and walk with support. He would also seek warmth and affection and his head-banging stopped. Our impression that the brothers were deprived was relayed to Fort Dix and to the parents. The children are now being followed closely at home.

Talbot has nicely shown that caloric insufficiency alone can produce severe growth retardation; he calls these children "hypocaloric dwarfs" (12, 11). Patton and Gardner have recently described five children quite similar to our C—— brothers (7). The home situations of these patients revealed rejection, poor physical care, and inadequate nutrition. After hospitalization there was a marked weight gain and improvement of emotional, motor, and language abilities. All the children were placed in foster homes and followed for a duration of 6 months to 7 years. The long-term response has been variable, but most of the children have remained well below the 50th percentile for their height and weight. Although we have finally diagnosed the problem of the C—— brothers and the initial improvement was encouraging, the long-term prognosis must remain guarded.

So far, we have discussed two patterns of parental deprivation. First, the acutely injured "battered child," and second, the rarer malnourished "hypocaloric dwarf." Our last patient demonstrates the long-term psychologic effects of being deprived.

J. R. was a 7-year old boy who was admitted to the Pediatric service for evaluation of headache and abdominal pain. Since infancy he had been the victim of beatings by both his parents. At 14 months, after a severe attack by his mother, who was subsequently placed in an institution, J. developed a detached retina. Later, the eye had to be removed. After this injury, he lived with an aunt who became his legal guardian. Complaints on this admission included abdominal pain, constipation, fatigue, and frontal headache. He was failing at school.

The patient was a fairly well developed boy, the principal finding of whose case was a flattened affect. After an evaluation on the ward, it was felt that his problem was of an emotional nature, and he was discharged to be followed by the Pediatric and the Psychiatric Departments.

Emotional problems are part of every phase of parental deprivation and are present long after the child is separated from his parents. Actually, emotional rejection is the most frequent type of deprivation. It can produce severe personality disorders. Many of these children, like J. R., show a shallowness of affect which implies an unfavorable prognosis and may later express itself in sexual aggressiveness, stealing, or lying (5). These symptoms may be alleviated by early restoration of affection by a fond foster parent, although this may not always be true. One of the patients described by Gardner was followed for 7 years. Despite the fact that she was hospitalized at 13 months of age, and given adequate nutrition, love, and affection, and at 2 years, placed in an excellent foster home, today she has severe personality disturbances and borderline intelligence (8).

Basically, the therapy for parental deprivation is simple; a child whose life and health are in danger from his parents must be removed from that

environment. Only the Juvenile Court has legal power to separate the child from his parents. The court may be reached via law enforcement agencies or such child welfare organizations as the SPCC (1, 10). This is most easily done through the hospital Social Service Department. In actual practice, this can be a most difficult and frustrating affair. All cases seen at NNMCM who are suspected of being abused by their parents have their records marked with a suitable warning and the case is discussed with the social worker. We, in the Navy, are fortunate—we can follow these patients and apply extra-legal pressure on the parents. When indicated, legal action is taken.

In summary, various patterns of parental deprivation are presented: the battered infant, the "hypocaloric dwarf," and the emotionally disturbed child. A method of handling these cases is suggested.

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Flicker as a Helicopter Pilot Problem*

Laverne C. Johnson Ph D. Aerospace Med 34(4): 306-310, April 1963.

Pertinent to the problem of flicker as a problem of the helicopter pilot is the current interest in the significance of the abnormal electroencephalogram (EEG) in selection of aircrew, and the relationship of EEG findings to episodes of altered consciousness in aviators. The use of photic stimulation as an EEG activating technic in evaluating patients with epilepsy is well established. It is also known that seizures can be produced in control subjects as the result of exposure to flashing lights. While the incidence of flicker-produced convulsions on nonseizure patients is unknown (but probably less than 1%), the incidence of epileptic-like discharges during photic stimulation is well established. In the young adult samples medium to extreme electroencephalographic photic activation has been found in 4% to 6% of subjects examined. Of direct interest is the finding by Watson that approximately 6% of pilot candidates for Army helicopter training demonstrated abnormal electroencephalographic discharges during photic stimulation. Based on these findings, Watson has recommended examination of all helicopter pilots for sensitivity to flickering light.

The subjects for this study were 102 pilots stationed at the Ream Field Naval Air Station. This is an operational helicopter field and all pilots assigned to this field have completed basic helicopter training as well as having 200 to 1000 hours of fixed-wing aircraft experience. Thirty-five of the pilots were examined during their first weeks at Ream Field. These pilots, though varying in amount of fixed-wing time, all had less than 100 hours of helicopter flight experience. The remaining 67 pilots were from operating squadrons. Their helicopter flight time ranged from 50 to 1200 hours with a mean of 500 to 600 hours. The average age of the sample was 26.3 years with a standard deviation of 4.40 years.

Flicker seems to be a source of annoyance or irritation to about one-third of experienced helicopter pilots. The problem is usually reported to be only minor or moderate in degree, but on occasion it may be severe enough to cause an accident or near accident. The two chief sources of flicker appear to be the rotor blades interrupting the sun's rays and the Grimes rotating anti-collision beacon. ~~The latter appears to be most distracting when flying under clouds, near water, or in fog.~~ The susceptibility to flicker and the degree of irritation appears to be directly related to fatigue.

EEG examinations with photic stimulation demonstrated that some of the pilots experienced the same subjective sensations during photic stimulation that they had experienced during flight operations. Several pilots offered suggestions as to how the procedure could be modified to make their experience

* From the U. S. Navy Medical Neuropsychiatric Research Unit, San Diego 52, Calif. This work was done at the U. S. Naval Hospital, San Diego and was supported by the Bureau of Medicine and Surgery under Research Task MR 005.12-2304.

in the laboratory more similar and perhaps, thus, increase the diagnostic effectiveness of the task as well as its use as a flicker simulator for new helicopter pilots.

Of interest are the 22 pilots who were awake until flicker began. Boredom was listed as a possible explanation for this phenomenon by Alexander and Chiles, but boredom does not seem to be an adequate explanation for these 22 pilots. In addition to being alert before flicker, many of these pilots were unaware that they were going to sleep. Those who did realize what was happening indicated they could not prevent it. "I felt myself getting sleepy but could not stay awake" was remarked by 9 pilots. Two described the flicker effect as "hypnotic." It is safely assumed that the EEG clearly reflected a state of lowered vigilance in these pilots—a condition of which 11 were not aware. Bach et al also were impressed by the consistency of the sensations of sleep, drowsiness, and hypnotism produced in subjects who were awake and alert before flicker. Bach noted that while actual sleep was never produced, "some state approaching sleep can be achieved using flickering lights on human subjects." Thus, it would seem that any discussion of flicker reaction in helicopter pilots should stress not only the problems of vertigo, distraction, nausea, and the possible alterations of consciousness, but also the possible hypnotic or somniferous potentialities.

The absence of paroxysmal EEG response during flicker in the 102 pilots studied is of theoretical as well as practical interest. It is possible that the technic used was not effective. Also it is possible that the pilots have become adapted to flicker. But most likely is the assumption that this sample represents a highly selected group with regard to both medical and technical screening and background. In a convulsive sample, the author's technic of stimulation has been effective in producing seizure discharges in 30%—an expected proportion in a clinical population. To date, in a nonclinical sample, 5% have exhibited extreme photic activation, with one of these nonclinical subjects having a grand mal seizure. Thus, the technic seems to be effective. Adaptation also does not appear to be a significant factor. Many of the pilots, especially those with little helicopter experience, reported they had had no experience with flicker and, thus, no opportunity to adapt. Research and clinical findings indicate that while the abnormal EEG response to flicker may not appear on each examination, adaptation does not occur. In contrast, the reverse effect is more common. That these pilots are different from the samples generally studied is obvious. All of these pilots have survived rigid preflight medical examination, plus yearly medical examinations. Also, most have had many hours in fixed wing planes before coming to helicopters. These pilots are those who have been left after various medical casualties, those lost in flight training and those who gave up flying soon after graduation have been deleted.

If there were more definitive information as to etiology of the flicker induced paroxysmal activity or as to its clinical significance, it would be easier to explain the absence of photic activators in this sample. However, based on clinical and research evidence, it should be reassuring to the flight surgeon and to the operational staff that these pilots are nonactivators.

Although photic stimulation does not appear to be useful as a screening technic for "latent seizure disorders" at this stage of a helicopter pilot's career, it does appear to have value in identifying those who find flicker irritating, annoying, or confusing. Also, it identifies a group of pilots in whom flicker produces a lowered state of vigilance. These findings suggest that if photic stimulation is to be used to screen pilots who may show EEG abnormalities or sensitivity during flicker, this screening should be done earlier, perhaps before any flight training in this type of aircraft.

Flicker during flight is reported as a problem for one-fourth of 102 helicopter pilots studied. Generally, this has been a minor problem; flicker is described as only annoying or distracting, but in one instance a near accident was attributed to flicker. At this stage of the helicopter pilot's career, photic stimulation does not appear to be a useful device to detect those who would show abnormal EEG activity during flicker. However, photic stimulation has identified pilots with subjective feelings of discomfort during the flickering light and, perhaps of more importance in at least one-fourth of this sample, their degree of alertness was markedly affected during flicker.

* * * * *



MISCELLANY

Submarine Medicine

The Submarine Medicine Division takes great pleasure in announcing that the below listed medical officers have recently qualified and been designated as Submarine Medical Officers by the Chief of Naval Personnel:

LT H. L. Bassham MC USN

LT A. P. Fischer MC USNR

LT J. A. Zimble MC USN

In qualifying for this designation, these medical officers have completed Submarine Medicine and Diving Schools, served in an operational billet for a minimum of one year, prepared a professional paper suitable for publication on some phase of this military medical specialty, and passed a comprehensive written and oral examination conducted by the Central Board of Medical Officers for Qualification of Submarine Medical Officers.

This designation authorizes these medical officers to wear the coveted and distinctive submarine medicine insignia on their uniform, thus joining a small but highly respected group of Navy physicians.

Navy Medical Unit Again Joins
Cholera Fight in Philippines

A team of U. S. Navy medical specialists from Taipei are aiding the fight against cholera in the Philippine Islands. The team set up laboratory facilities in Manila to aid Philippine medical authorities.

U. S. Military personnel, dependents and civilians assigned to the Asian mainland and the Philippines, are required by regulation to receive cholera immunization. Reimmunization against cholera is required every six months in these areas. As part of its program, the Navy medical team is conducting research on the use of radioactive isotopes to trace the course of body substances in cholera victims.

The cholera fatality rate among patients at the San Lazaro Hospital in Manila has dropped from 17% to 2% since the Navy medical team began its work less than two years ago. —Washington (AFPS)

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Letter of Appreciation

"CMSW D. E. Sabin, U. S. Navy
Sanitation Officer
U. S. Fleet Activities, Sasebo

You have been rendering full cooperation and untiring efforts to the city of Sasebo in the field of public sanitation since you assumed the duties of Sanitation Officer, Fleet Activities, Sasebo, Japan in August 1960.

Many activities done by you, especially guidance for prevention of venereal disease and maintenance of environmental sanitation at various establishments catering to the U. S. military personnel, have been invaluable contributions to the city administration.

On the occasion of your departure from Japan, I, representing the citizens, wish to express my sincere gratitude for your energetic cooperation and wonderful achievement.

/s/ ICHIZO TSUJI
Mayor, City of Sasebo"

NOTE: Item was forwarded by CAPT Wilson D. Tucker MC USN, Head of Medical Department, U. S. Fleet Activities, Sasebo, Japan. He considers the letter of appreciation to be "the result of the personal efforts of Mr. Sabin to enhance the People-to-People Program and maintain strong allied professional relations with the local Japanese civil government." —Editor

(CAPT Tucker's new duty station: USNH, Camp Pendleton, Calif., as Chief of the OB-GYN Service. He is certified by the American Board of Obstetrics and Gynecology.) —Editor

High Tributes to Admiral Calver on Capitol Hill

Culminating thirty-five years of service as physician to the Congress of the United States, Doctor George Wehnes Calver has been honored by the Council of Federal Medical Directors for Occupational Health. On behalf of the Council, Vice-President Lyndon B. Johnson presented Dr. Calver with a certificate of honorary life membership as "The Dean of Federal Physicians," and "in recognition and appreciation of his inspiring leadership in promotion and elevation of the Profession of Occupational Medicine and his great worth and distinction as a physician and benefactor of humanity and service to the United States of America." The noon luncheon ceremony was held in the Banquet Room of the U. S. Senate.

Leading many tributes from prominent persons, President Kennedy, a former patient, sent a telegram to say that Dr. Calver "has performed a unique responsibility in the Congress of the United States with distinction and judgment."

Speaker of the House John W. McCormack, also a long-time "patient" dropped in at the luncheon to offer his praise of Dr. Calver who is a Rear Admiral, Medical Corps, U. S. Navy (Retired).

After the ceremony, Admiral Calver revealed in an interview that the current group of Congressmen is "a little more healthy and a bit more health conscious than previous groups." Explanation: "They get picked on more by the doctor." He praised the Congressmen for responding to his call for their annual physical examination, including an electrocardiogram. His "Ten Commandments of Health" contain a provision to "eat wisely and drink plenty of water." Others are: exercise reasonably, accept stressful situations or problems rationally and without worry or tension, play with enthusiasm, relax peacefully and completely, obtain sufficient sleep, and check up on the physical and mental inventory from time to time.

The recommendation on daily exercise was taken seriously by then Senator Harry S. Truman whose vigorous early morning walks are widely known.

Dr. Lee K. Buchanan, President of the Council of Federal Medical Directors for Occupational Health, told those attending the ceremony that Dr. Calver has faced numerous challenges in his 35-year career. He added: "Watching over the health of the nation's legislators as they carry out the responsibilities of



Dr. George Wehnes Calver

their high office, Dr. Calver has frequently been on round-the-clock duty during continuous sessions. He is a dedicated physician who is available at all times to comfort, counsel, and provide emergency medical care to all. Although his role is not unlike that of an occupational health physician serving employees in commerce and industry, the significance of the work of his occupational group has often imbued his ministrations with a sense of drama. Examples are the case of the asthmatic legislator, obviously in great distress, who insisted on staying until a vital measure had been voted on, and the case of another legislator who demanded that he be brought to the Capitol on a stretcher so that he could cast his vote."

"Although the life of a member of Congress, as that of anyone else, cannot be measured in terms of dollars," Mr. Buchanan said, "the American public has a vested interest in conserving the nation's leadership resources." In his medical relationship to Congress, Dr. Calver places primary emphasis on the prevention of coronary heart disease, and the annual physical examination and electrocardiogram are part of this program. He is also stressing weight control through proper eating and regular exercise. Such exercise is encouraged by the installation of a gymnasium in the New House Office Building and the improved facilities, including swimming pool, that will be available in the Sam Rayburn Building.

Some measure of the success of Dr. Calver's preventive efforts may be found in the 70% reduction in deaths from coronary disease among Congressmen since he took office.

A naval career officer since 1913, Dr. Calver was assigned in 1928 to duty at the U. S. Capitol to be in attendance on the Sessions of Congress as the result of a resolution passed by the House of Representatives, . . . at which time Congressmen were dying at the rate of about twenty per year from cardiovascular diseases. In 1931, the Congress passed legislation to prohibit his transfer until otherwise provided by law.

Dr. Calver has also continued to work in his two research activities at the National Naval Medical Center, Bethesda, Maryland, where he spends several hours each week. His Electrophoresis Laboratories in the U. S. Naval Medical School and the Naval Medical Research Institute have been conducting research for two years on "Serum Protein in Diseases." These laboratories have likewise done much work on the rare hemoglobins, blood amino acids, lipoproteins of the blood, multiple myeloma, leukemia, and a wide range of malignancies, as well as electrophoretic studies connected with the great problems of atherosclerosis and coronary artery disease. He originated the "Use of Acrylamide Gel Electrophoresis" and designed the apparatus for this method.

Born in Washington, D. C., Dr. Calver received his M. D. degree from George Washington University in 1912 and took his residency training at Providence Hospital. He is a Fellow of the American College of Surgeons, American College of Physicians, American College of Cardiology, American Association for the Advancement of Science, and the American Geriatrics and Gerontological Societies. He is a member of the American Medical Association, the District of Columbia Medical Society, and various other professional associations.

New Broadcasting System for Civil Defense Emergencies

The new plan for broadcasting in a national civil defense emergency went into effect on August 5, 1963. The plan was distributed to broadcasters by the Federal Communications Commission in July. Under the plan, an Emergency Broadcasting System (EBS) replaced CONELRAD as the means of disseminating information and instructions to the public in a national emergency.

The public should now disregard the specially marked points on the AM radio dial formerly reserved for civil defense broadcasts in emergency, and tune in local stations at their regular position on the dial. More than 1300 broadcasting stations are participating in the EBS. The plan will permit additional AM stations to broadcast in an emergency, increasing the coverage obtained nationwide. It is planned to add FM and TV stations to the EBS as soon as technical arrangements permit.

—TIO, BuMed Info Memo, 14(6), 14 August 1963

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Historical Note - U. S. Naval Hospital Brooklyn, New York

On 22 August 1920, the Brazilian battleship MINAS GERAES entered New York Naval Shipyard, Brooklyn, N. Y., for an overhauling of the ship's machinery. During the latter part of September and the first of October, 90 cases of beri-beri were received at the U. S. Naval Hospital, Brooklyn, from the ship's crew. The first 3 cases were practically moribund on arrival at the hospital; one died in 48 hours, one in 3 hours, and one immediately.

CAPT F. E. McCullough and LT W. B. Dukeshire MC USN, went on board the ship to consult her medical officer regarding a general change in diet for the crew and also to see if there were other cases of mild degree that required hospital treatment. After the consultation, 60 cases were sent immediately to the hospital and within the next few days, 27 more. The effect of the change in diet was the absolute stopping of the epidemic. Of the 87 cases, none died and all were returned to the ship by January 17, 1921.

In September 1921, in gratitude for the medical aid and assistance rendered by personnel of the Brooklyn Naval Hospital, the crew of the MINAS GERAES and the Brazilian government presented to the Naval Hospital a bronze statue of mother holding sick child. Commanding the Brooklyn hospital during this period was CAPT (later Rear Admiral) Charles T. Lownes MC USN. When the Brooklyn Naval Hospital was decommissioned in 1947, the statue was turned over to St. Albans Naval Hospital where it is housed in the Naval Medical Museum.

* From CAPT F. Kent Loomis USN (Ret), Assistant Director of Naval History, Office of the Chief of Naval Operations, and CAPT R. G. Gerry DC USN, USNH St. Albans. Partly adapted from the 1921 Annual Report of the Secretary of the Navy (Surgeon General's Section).

FROM THE NOTE BOOK

USNH Jacksonville Wins Ironman Trophy. For the first time since its inception at the Naval Air Station in 1952, the Ironman Trophy was won by a shore based activity - the U. S. Naval Hospital. Also, this is the first time the Naval Hospital, commissioned in 1941, has won such athletic recognition. The trophy was presented to CAPT J. M. Hanner, Commanding Officer, at the Semiannual Sports Banquet held at the Blue Jackets Inn at the Naval Air Station.

The Ironman Trophy is presented semiannually to the command which accumulates the most points as a result of participation in the Intramural Sports Program. If it is won four times by one command, it is retired by that command. To accumulate points required for winning the trophy, USNH Jacksonville excelled in golf, soft ball, track and field, and swimming.

American College of Surgeons Annual Meeting. This Annual Meeting will be held in San Francisco, Calif., on 28 October through 1 November 1963. A special airlift is being tentatively scheduled to accommodate medical officers of the Armed Forces who desire to attend this meeting. The airlift will depart from Andrews Air Force Base, Washington, D. C., on Sunday, 27 October, and return to Washington on Saturday, 2 November. Stopovers will be made at the U. S. Naval Air Station, Glenview, Ill., for passengers.

Interested medical officers should forward request for reservations at least 3 weeks in advance of the meeting to: Director, Professional Division, BuMed; or telephone OXford 61280 or 61834. Further information concerning the airlift will be announced later. —Surgery Branch, ProfDiv, BuMed

USNH Yokosuka to Host ACP Far East Session in 1964. The Fourth Annual Far East Session of the American College of Physicians will be held at the U. S. Naval Hospital, Yokosuka, Japan, on 21, 22, and 23 May 1964. The general subject will be "Puzzles and Problems in Medicine." All addressees are cordially invited to submit papers for presentation at this meeting. The General Chairman will be CAPT G. M. Davis MC USN, F. A. C. P., Commanding Officer, U. S. Naval Hospital, Navy #3923, FPO, San Francisco, Calif. The Program Chairman will be CAPT R. E. Faucett MC USN, U. S. Naval Hospital, Navy #3923.

Contact Lenses for Underwater Use Developed at NMRI. CAPT E. L. Beckman MC USN, Environmental Stress Division, Naval Medical Research Institute, NNMC, Bethesda, Md., and Mr. Alan H. Grant, Optometrist, Wheaton, Md., have developed contact lenses for underwater use. The new lenses can be ground to prescription or can be worn by skindivers with normal vision to permit clear underwater vision without goggles or face masks. Ordinary contact lenses float off in water, but the new ones do not as they cover most of the eyes and the lids help hold them in place. The lenses can be used in experimental and escape training tanks and by the Navy's underwater demolition teams. Face masks and goggles may be a hazard when they jam against the face when exposed to underwater explosion.

CAPT Vasa Appointed to A. O. F. Research Council. CAPT Ralph A. Vasa MSC USN has been appointed to membership on the Advisory Research Council of the American Optometric Foundation. The appointment, effective since 15 July 1963, is for a period of five years. The Advisory Research Council is a group of fifteen top specialists in the optometric field, serving the American Optometric Foundation without reimbursement as a consulting committee advising on areas of research, expenditures of research funds, investigation of educational programs, and the screening of applicants for research grants and fellowships.

Medical Aspects of Advanced Warfare

This course is designed to familiarize key Medical Department officers with the general characteristics of, and the problems associated with, air warfare systems with particular emphasis placed on nuclear weapons, missile delivery systems, and medical problems related thereto.

<u>Class</u>	<u>Inclusive Dates</u>	<u>Deadline Date to Apply</u>
63-B	4 - 8 November 1963	1 October 1963
64-A	27 April - 1 May 1964	10 March 1964

The above scheduled courses will be conducted by the U. S. Air Force at the Medical Service School, USAF, Gunter Air Force Base, Alabama. SECRET security clearance is required on all candidates for attendance, and selections will be made on a "need-to-know" priority basis.

Requests should be forwarded in accordance with BUMED INSTRUCTION 1520.8 and comply with the deadline dates indicated above. All requests must indicate that a security clearance of SECRET has been granted to the officer requesting attendance, and an explanation in regard to their "need-to-know."

Meetings at USNH Oakland. Staff officers at U. S. Naval Hospital, Oakland were hosts for two professional meetings in September.

Approximately 90 civilian dentists attended the Alameda County Dental Society meeting on 10 September. CAPT Paul W. Suitor DC USN, Chief of the Dental Service, welcomed the guests aboard and presented a paper on "Oral Pathology"; LT Larry L. Nash DC USN spoke on "Antibiotic Therapy in the Dental Department."

Members of the Alameda-Contra Costa Medical Association held their annual Oak Knoll meeting on 16 September, with RADM C. L. Andrews MC USN, Commanding Officer, as official host. CAPT Donald W. Robinson MC USN Chief of Surgical Service, was program chairman; CDR Raymond L. Watten MC USN, Director of the Clinical Investigation Center, presented a paper on "Blackfoot Disease"; CDR Donald W. Edwards MC USN of Surgical Service discussed "Lipomas of the Thorax."

Refreshments and dinner were on the agenda for both meetings.

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DENTAL

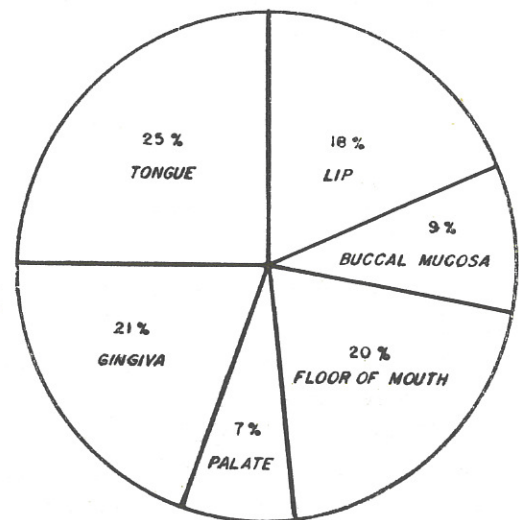


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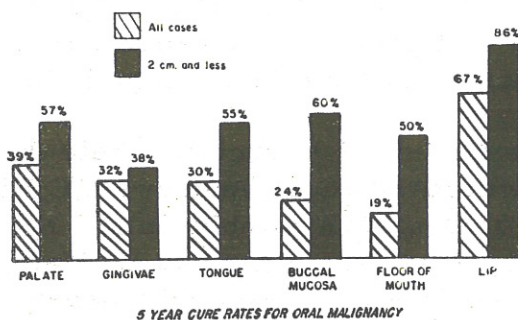
An Investigation of the Life History of
Carcinoma of the Oral Cavity

Alvin F. Gardner, DDS, MS, PhD; W. J. Bowen, DDS; and R. L. Brown, DDS. J Dent Med 18(3): 131-142, July 1963.

One hundred and fifty case histories of oral malignancies dating from 1942 to 1962 were studied at the University of Maryland Hospital, Baltimore, Maryland. The case histories were random samples taken from several hundred cases of oral malignancies admitted to the University Hospital during the past 20 years. Since random samples were taken, the study was not intended to be completely comprehensive, but rather a survey of oral malignancies admitted to the hospital in the hopes of finding some characteristic in the life history of oral neoplasms. The material was then correlated with the information found in the literature.



Location and per cent of oral malignancies resulting from this investigation.



5 YEAR CURE RATES FOR ORAL MALIGNANCY
Distribution of oral malignancies in University of Maryland Hospital during past twenty years, including 5 year cure rates for oral malignancy.

One of the most important facts known about the treatment of oral cancer is that the disease must be recognized and treated early or the prognosis and cure rate are poor. The difficulty is that cancer, especially in the incipient stage, has no characteristic appearance that can be easily recognized. There are certain precancerous lesions which should be given more careful consideration than is usually the case. Therefore, it is of the utmost importance to diagnose the precancerous lesion at an early stage. The most important precancerous lesion is leukoplakia.

Possible Etiological Factors in Oral Cancer

<u>Site</u>	<u>Use of Tobacco %</u>	<u>Leukoplakia %</u>	<u>Poor Oral Hygiene %</u>	<u>Syphilis Number</u>
Tongue	-	18	90+	4
Gingiva	17	-	21	-
Lip	64	-	-	-
Floor of mouth	16	3	-	-
Buccal mucosa	55	12	8	-
Palate	-	-	-	-

Among the many sound conclusions presented were the following:

1. The size of the lesions varied from a few millimeters to several inches.
2. The type of lesion varied from small mucosal thickenings to large fungating masses.
3. The most frequent occurrence of oral cancer was on the tongue; the least frequent was on the palate.
4. The lesions of the buccal mucosa had the lowest mean age for occurrence; the lip and palate had the highest mean age for occurrence.

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Effects of Local Anesthetics
on Pulp Tissue

Kaare Langeland DDS, PhD, Institute of Dental Research, Josefinegate 32, Oslo, Norway. Dental Progress 3(1): 13-18, October 1962.

Immediate effects of various local anesthetic solutions on dental pulp were studied by comparing sections from teeth extracted under local or general anesthesia or with no anesthesia at all. Long-term effects of a local anesthetic administered in connection with treatment were studied by observing the reaction of dental pulp to cavity preparation.

Although all sections showed variability, no unique or grossly deviant appearances distinguished sections taken after extraction under local or general anesthesia or with no anesthesia at all.

In the reaction of dental pulp to cavity preparation per se, no differences were observed whether or not a local anesthetic was administered before treatment; nor were differences seen in another series in which zinc oxide and eugenol were inserted in such cavity preparations.

No differences were observed among the local anesthetic solutions used.

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Pulp Damage
by Induced Inflammation

Capt Carl A. Ostrom DC USN, Head, Professional and Research Branches, Dental Division, Bureau of Medicine and Surgery. Dental Progress 3(4): 207-210, July 1963.

Many operative factors involved in cavity preparation can be inflammatory. Rotational speed, size of cutting tool, duration of cutting, force applied to cutting tool—all these add to the heat generated and the need for proper cooling. The coolant system, if adequate, protects the tooth from each of these traumatic factors.

The present data suggest that the air-water spray used was highly effective in controlling operative inflammation so as not to distort the experimentally induced condition. That a few cases in the control group (and with greater than average dentine remaining) did show inflammatory responses suggests that the air-water spray may have failed in these cases; angulation or slippage of the spray tip may have been responsible for the observed variability.

In extension to clinical practice the present results point out the importance of an adequate air-water coolant and the need to maintain moist cavity preparations.

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Personnel and Professional Notes

Dental Division Personnel Changes. The following dental officers have reported for duty in the Dental Division, Bureau of Medicine and Surgery:

Code 611 Head, Professional and Research Branches
Capt C. A. Ostrom DC USN

Code 612 Head, Planning and Logistics Branch
Capt E. T. Nealon DC USN

Code 613 Head, Personnel Branch
Capt P. A. Moore DC USN

Code 6131 Assistant to Head, Personnel Branch
Capt G. Colby DC USN

Casualty Treatment Training, NORVA. One Reserve dental officer and seven Georgetown University dental students, on board for two weeks active duty for training, have completed the Casualty Treatment Training Course at the U. S. Naval Dental Clinic, Norfolk, Virginia.

The course, under the supervision of Bureau of Medicine and Surgery, is one of the four conducted throughout the Navy to develop in dental officers such skills in emergency casualty treatment as to make full use of their professional knowledge, thus enabling them to amplify the medical effort in time of major emergency. This was the third course to be conducted here this year.

The next regular class convened on 22 July 1963. Similar courses also are held at Bethesda, Maryland, Great Lakes, Illinois, and San Diego, California. The Casualty Treatment Training Course is under the direction of LCdr H. C. Pebley DC USN. Rear Admiral E. G. F. Pollard is Commanding Officer of the U. S. Naval Dental Clinic.

Capt Losee Participates in Professional Meeting. Captain Fred L. Losee DC USN presented a paper, "Soils, Minerals, and Health," 6-8 August at the Gordon Research Conference on Food and Nutrition. The conference was held 5-9 August 1963 at Colby Jr. College, New London, New Hampshire.

Capt Losee is presently assigned as Dental Research Officer, Dental Research Facility Division, USNTC, Great Lakes, Illinois.

Workshop Presented at U. S. Naval Dental School. In order to evolve more effective teaching methods, the U. S. Naval Dental School held a workshop for its instructors on 15 and 16 August 1963 at the National Naval Medical Center, Bethesda, Maryland.

Dr. John C. Lang, Head, Curriculum and Instruction Branch, Bureau of Naval Personnel, Department of the Navy, discussed the group process and problem solving in learning-teaching, and led two group work sessions; one to develop a functional philosophy for learning and teaching at the Naval Dental School, and the other to identify the most crucial teaching problems and to recommend solutions.

Mr. Ellis A. Woody, Head, Career Planning Division, Federal Aviation Agency, also took part in the workshop in presenting a series of lectures on the learning-teaching processes and their evaluation.

The workshop was conceived by the school's Commanding Officer, Capt Arthur R. Frechette DC USN and was directed by Capt Louis S. Hansen DC USN, Head of the Officer Education Department.

The Chief of the Dental Division, BuMed, Supports Relief Campaign of the ADA. The 1963-1964 Relief Campaign of the American Dental Association is now under way. RAdm F. M. Kyes, DC, USN, Chief of the Dental Division, supports this campaign and hopes that a greater proportion of members will contribute and share in the privilege of assisting dentists and their families who are in distress. The Relief Fund needs and deserves the support of every dentist in the nation. Every dollar of every contribution goes for relief purposes. The Relief Fund is unmatched among professional associations since it is supported solely by contributions from the profession.

USS CORAL SEA Commemorates 21st Anniversary of Battle. During a recent visit to Sydney, Australia, Dental Department personnel of the USS CORAL SEA participated in the celebrations of the 21st anniversary of the Battle of the Coral Sea. During visiting hours on board the ship, approximately 700 professional and pre-professional guests toured the dental spaces. A general clinic was held by the ship's dental officers for Royal Australian Naval Dental Officers in the area. Capt R. W. McKee is the Senior Dental Officer, USS CORAL SEA.



PREVENTIVE MEDICINE

Cerebrospinal Meningitis in Africa

WHO Chronicle 17(7):256-263, July 1963.

In Africa meningococcal cerebrospinal meningitis is severe, especially in children whose natural resistance and immunity level are always lower than those of adults. From the sight of these children huddled feverishly in the darkest and coolest corner of their hovels, becoming quickly dehydrated and then comatose, periodically shaken with convulsive attacks, stricken down by the disease as by a thunderbolt, it is easy to understand why an aura of witchcraft has for centuries surrounded meningitis in Africa. This form of meningitis mainly affects an area lying north of the equator—a long thin belt of country stretching from the Atlantic Ocean to the Red Sea, limited to the north by the desert and to the south by forested country with clearings. On the map, this belt of country lies very roughly between latitudes 8° and 16° N and crosses a number of different States, in several of which meningitis is a problem that goes beyond mere statistics. Figures are given below of the numbers of cases and deaths from meningitis in some of these countries for the years 1950-60:

	<u>CASES</u>	<u>DEATHS</u>
Ghana	5, 676	970
Mali	14, 045	2, 280
Niger	15, 644	4, 434
Chad	28, 776	9, 547
Upper Volta	51, 544	8, 452
Sudan	106, 752	13, 654
Nigeria	117, 835	14, 019

Meningitis swept through Chad, Nigeria, the Sudan, and the Upper Volta in 1961, and the Niger and Nigeria suffered a severe epidemic in 1962.

A recent supplement to the Bulletin of the World Health Organization¹ contains the findings of an epidemiological study of cerebrospinal meningitis in Africa, carried out on behalf of WHO by Professor L. Lapeyssonnie, of Marseilles, France. This study is in two parts, one analyzing the data obtained by the author in the 5 African States most affected by meningitis (the Republic of the Niger, the Republic of the Upper Volta, Northern Nigeria, the Republic of

¹ Lapeyssonnie, L. (1963) Bull. Wld Hlth Org., 28, Suppl.

Chad, and the Republic of the Sudan), the other containing general observations on meningitis in Africa.

Data from Five African Countries

The 5 countries most affected by meningitis are each studied separately, the author basing his study on official data and on observations he has made on the spot in his long career as an epidemiologist in Africa.

The Republic of Niger

The Republic of Niger is a vast peneplain of low elevation, out of which rise plateaus and mountains reaching a height of between 500 and 1500 meters. The country is divided into 2 entirely different regions by the 16th parallel; to the north lies the desert part of the Niger; a waste of sand dunes extending up to the foot of the Tibesti range and passed through rather than inhabited by nomads; to the south, up to the Nigerian frontier, lies the fertile part of the Niger, the cultivated area where meningitis occurs.

A wave of epidemics ravaged Niger in 1905-08, another in 1921-24. Then after a long respite a fresh wave appeared in 1937-39, affecting 9,083 persons and killing 3,991, in spite of the advent of sulfonamides. There was a lull for 4 years, then the disease again appeared in epidemic form; this was a particularly severe cycle, lasting from 1944 to 1946 and accounting for 22,170 cases and 7,198 deaths. After another respite, a 5th epidemic wave occurred, lasting for 3 years and claiming 16,909 victims of whom 4,849 died. In 1961-62, after an interval of 8 years, meningitis reappeared in the Niger; there were 19,559 cases and 2,344 deaths.

The changes in the case fatality rate during these epidemics are of interest, the author's figures showing that the rate declined in each successive cycle:

<u>Epidemic cycle</u>	<u>Case fatality rate (%)</u>
1907	Unknown
1921-24	85
1937-39	43.9
1944-46	32.4
1949-51	28.9
1960-62	11.8

The author also points out that for the first 5 months of 1962 the total number of notified cases amounted to 14,776 and the number of deaths to 1,375, the case fatality rate being 9.3%. If it is borne in mind that the untreated disease is usually fatal, and that diagnosis and treatment present unusual difficulties in Africa, it will be realized that a case fatality rate like this represents an enormous amount of effort, attended by a considerable degree of success, on the part of the public health authorities.

The Republic of the Upper Volta

The Upper Volta is a flat country relieved by a few hills and cliffs to the north and west. Climatically and demographically, it is divided into two by isohyet 1050. North of this line, the climate is savanna in type, with the dry and the rainy seasons well defined; this region, by far the larger, has frequent meningitis outbreaks. The region to the south, the capital of which is Bobo-Dioulasso, is subtropical with a long rainy season, August and September being particularly wet. Here meningitis is more or less unknown.

The Upper Volta suffered from 2 tremendous cycles of epidemics that swept over the whole of western Africa in 1906-08 and 1920-23. A new cycle, starting in the Sudan in 1937, reached the Upper Volta 2 years later accounting for 6,783 cases in 1939, and 4,730 in 1940.

Since that date epidemiological information has been more complete and shows that the main characteristics of meningitis in the Upper Volta have changed since 1950. Until then, the epidemic outbreaks originating outside the country were more or less severe and prolonged, but their chief characteristic was that they vanished almost completely; after the epidemic, the epidemiological position returned to zero, or practically zero. After 1950, on the other hand, the disease seems to have become epidemic in the country. Year in and year out, 3,000 cases are notified in the territory as a whole, and the epidemiological level can now be regarded as starting from a higher base-line, with acute epidemic spikes during the same months every year. Epidemiologically, the situation is as follows: the first cases of meningitis are notified in November and December; the number increases in January and February and reaches a maximum in April, which marks the end of the dry season; there is an abrupt fall in May; and during the rainy season (June-November) practically no cases are notified. Lapeyssonnie describes this situation as one of sporadoendemicity with seasonal exacerbations, and notes the smouldering character of the disease in the Upper Volta, where it is always liable to burst out in epidemic form.

Northern Nigeria

The Federation of Nigeria is the result of the political union of 3 main regions, one of which, Northern Nigeria, suffers from epidemics of meningitis. This region is an immense plateau, rising to a height of 2,000 meters and declining in the north towards the basins of the river Komadougou Yobe and of Lake Chad. The landscape changes progressively towards the north: first savanna country, it becomes semi-desert, with dry plains of scanty grass and increasingly stunted trees. The climate is the same as that favoring the outbreak and spread of meningitis in the Niger and the Upper Volta—a semi-desert climate with one relatively short and clear-cut rainy season. In northern Nigeria, as in the other "meningitis countries," the southern limit of the epidemic lies around isohyet 1050, which, in spite of the disturbances caused by the mountain masses of the Nigerian plateau, more or less follows the 11th parallel.

The epidemic cycles of meningitis in northern Nigeria appear to coincide with those in the Niger and the Upper Volta. The epidemics are severe: in those of 1948-52 there were 119,603 notified cases and 18,319 deaths. In the last epidemic cycle, 1959-62, there were 50,558 cases with 3,903 deaths, a rate of 7.7%. The author, speculating on the reasons for these improved figures, puts forward the view that in many centers looked after by nurses (and not by doctors) large numbers of non-meningococcal infections have been labeled as meningitis. From the practical point of view, it is obviously preferable to give sulfonamide treatment to a patient who may not be suffering from meningitis than to run the risk of leaving a possible case of the disease undiagnosed and untreated. From the epidemiological point of view, however, diagnosis without a proper scientific basis is liable to produce inaccurate statistics and wrong conclusions.

The Republic of Chad

The central situation of the Republic of Chad makes it a busy thoroughfare, a traditional crossroads between the basins of the Nile and the Niger on the one hand, between the Congo basin and the Sahara on the other. This must be borne in mind in considering a transmissible disease of epidemic potentialities like meningococcal cerebrospinal meningitis.

As in the other countries where meningitis occurs, the climatic data are supremely important. Meningitis is most severe in the central and southern regions, where there is a long dry season—cool from November to February, hot from March to May—and a short rainy season from June to October. This is the area, too, where the population density is greatest. To spread and persist, meningitis needs not only a favorable climate but also a sufficient density of human beings for its transmission.

The first epidemic wave, originating probably in Nigeria, seems to have spread over the country in 1924 when 150 cases were notified and 120 deaths (the case fatality rate being 80%). Lapeyssonnie distinguishes five periods in the history of epidemics of meningitis in Chad. (1) From 1924 to 1934 only a few dozen sporadic cases were observed, but the case fatality rate was high, being about 80%. (2) From 1935 to 1939 there was an epidemic, originating in the (then Anglo-Egyptian) Sudan with 10,200 cases and 7,515 deaths (case fatality rate, 75%). (3) Between 1940 and 1951 meningitis remained at a higher endemic level with seasonal exacerbations, and there was a big outbreak in 1950 (5,415 cases with about 4,000 deaths) and an even bigger one in 1951 (13,393 cases with 3,412 deaths). In 1950, the disease was fulminating in type, resulting in a very high case fatality rate, (74%), in spite of the improvement in the therapeutic armamentarium—sulfonamides having been used on a large scale since 1939. (4) From 1952 to 1960, meningitis resumed its endemo-sporadic character with seasonal exacerbations. (5) Finally, in 1961 and 1962 a fairly large number of cases of meningitis were notified. The author wonders, however, whether the cases notified in the last period were really cases of meningococcal meningitis and not meningeal reactions to

quite different infections for, out of 36 cultures of cerebrospinal fluid taken from hospitalized patients for meningitis at Fort-Lamy, only 5 grew meningococci, 27 were negative, and 4 grew other bacteria. Similarly, in an epidemic localized to Bassimafou and its outskirts, the author took many samples of cerebrospinal fluid, which on culture proved to contain Moraxella duplex.

The Republic of the Sudan

By its geographical situation and its historic vocation, the Sudan has been a crossroads and a melting-pot of races and cultures for thousands of years. Every year it is crossed by multitudes of Muslim pilgrims from the whole of West and Central Africa on their way to and from Mecca.

This immense country can be divided into 3 climatic zones: (a) to the north, a zone with a warm Saharan climate consisting of a cold and a warm season, both dry; (b) between latitudes 12° and 18° N, a central zone of greater humidity in which rain falls mainly in July, August, and September, progressively more heavily and for a longer part of the year towards the South; the relative humidity increases fairly abruptly in June-July, its fluctuations depending on the weather conditions created by the meeting of the dry winds from the north and the summer monsoon with its wet winds from the south-east; (c) a zone south of latitude 12° N where the humidity is much greater; no month is rainless (November to February are only relatively drier), and the climate is almost equatorial in type. The areas favoring cerebrospinal meningitis are the central zone and certain parts of the southern zone, protected by mountains and thus within the areas bounded by isohyets 1000 and 1100.

The 10 million Sudanese, of very diverse origin (Bantu tribes south of the 10th parallel, Hamitic people of the Caucasian branch of the white race north of this parallel, heterogeneous groups—Nubas, Furs, Ingessana—in the center of the country), are mainly grouped in a roughly crescent-shaped area starting at Port Sudan on the Red Sea, running along the frontier with Eritrea, entering the valleys of the Blue Nile and the White Nile, and following a westwards course south of Kordofan and Darfur. In this area the mean density of the population is 10 per km^2 , and through it travellers to and from West Africa must necessarily pass on their way to and from the Red Sea. This is also the area (to which must be added several well-populated localities in the southern provinces of Bahr el Ghazal and Equatoria) over which the epidemics of meningitis sweep.

Cerebrospinal meningitis seems always to have existed in the Sudan, where it is popularly known as "Abu-el-Farrar" (the hatchet disease). The celebrated Mahdi is supposed to have died from it in 1885. The annual reports of the colonial medical services show that it existed, mostly in an endemo-sporadic form, from 1908 to 1933. The increasing wealth of health data thereafter permits the history of the disease to be studied and a certain number of epidemic cycles to be distinguished.

The first epidemic cycle extended over the years 1934, 1935, and 1936. Meningitis started in the extreme south of the country, reached the south of Kordofan, then the Blue Nile province, and finally, and especially Darfur, where 8,833 cases were notified in 1936, with 6,158 deaths.

The second cycle began with a violent outbreak in Bahr el Ghazal in 1939, and persisted in the 3 southern provinces of the Sudan, its peculiarity being that it continued throughout the rainy season. This cycle lasted nearly 9 years and affected more than 20,000 people. Because sulfonamides were used, the case fatality rate was under 20%—a far cry from the 75% of the 1936 epidemic at Darfur.

A third cycle began in 1950 lasting 3 years, with 71,840 cases and 9,718 deaths, case fatality rate 13.4%. This cycle coincided with the one occurring at the same time in other African countries, and established the Sudan as an endemo-sporadic state with seasonal exacerbations and successive epidemics.

A fourth cycle began in 1954 and lasted until 1959. This cycle affected the southern province of Bahr el Ghazal where, in 6 years, nearly 25,000 cases were notified. These were successfully treated with sulfonamides.

A fifth cycle occurred in 1961 and 1962, affecting particularly the provinces of Equatoria and Darfur, where in several months 2,233 cases were notified, with only 186 deaths. The author stresses the fact that at the end of the dry season in 1962, practically all the provinces of the Sudan were affected by meningitis.

From all these epidemiological data, the author concludes that in the Sudan there is a clear alternation of epidemic cycles between the 3 southern and the 6 central provinces, the country practically never being affected as a whole at one time. Meningitis tends to be rooted in an endemo-sporadic state more long-lasting and of greater importance in the southern province than in the northern provinces. What possible reason can there be for these epidemiological differences? Perhaps the special climatic conditions of the southern provinces are responsible.

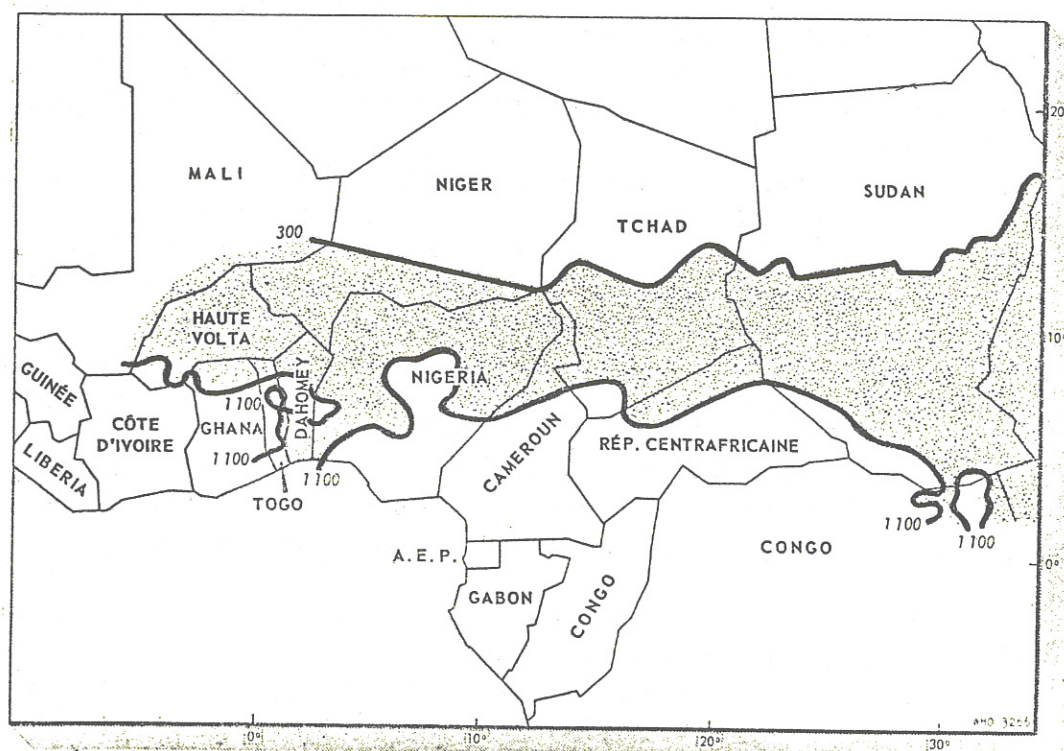
General Observations

The above survey of the epidemiology of cerebrospinal meningitis in 5 African States brings out two essential points. One, related to space, is that a "meningitis belt" exists in Africa; the other, related to time, is that there are epidemic cycles that gradually give way to an endemo-sporadic state with seasonal exacerbations.

The Meningitis Belt

In that part of Africa that lies in the northern hemisphere, meningococcal meningitis appears in epidemic form only in a relatively narrow belt of country traversing the continent. Lapeyssonnie proposes that this should be called the "meningitis belt." This belt depends on rainfall, which exerts its influence either directly (by some mechanism as yet unknown) or indirectly, by favoring human settlement or by limiting it in scale. The northern boundary of this belt is formed by isohyet 300, which misses the Upper Volta, crosses the Niger obliquely, cuts across the southern part of Lake Chad, curves north, includes Darfur (so often attacked by meningitis) in the Sudan, and follows the 15th parallel to the Nile, there turning north to the mountains overhanging the Red Sea.

THE MENINGITIS BELT IN AFRICA



The southern boundary of the belt is formed by isohyet 1100. This separates sharply the Sudan type of climate to the north from the Sudan-Guinea type to the south, with different flora, fauna, and ways of life. Lapeyssonnie stresses that to cross isohyet 1100 means entering a different world; to the north is the meningitis country, which looks the same all the way from Bamako to Khartoum. It is shown on the map, crossing the continent rather irregularly from the Atlantic coast to the mountains of Ethiopia. A curious but important point is that meningitis has never been epidemic within the loops of the isohyet (around Bobo-Dioulasso, for example, or Banfora).

A comparative study of rainfall and of epidemics of meningitis in the southern provinces of the Sudan, particularly Equatoria, shows that total precipitation plays a much more important part in the etiology of epidemics than the seasonal distribution of the rainfall.

The meningitis belt is 4200 km long, from the Upper Volta to the Sudan, and on the average 600 km wide, the width varying from 350 km in eastern Nigeria to 1000 km in the Sudan. The area is about 2,500,000 km², or 1/3 of the total surface area of the 5 countries studied. An important point is that the belt is traversed from end to end by a road that takes travellers from Orodara, on the western boundary of the Upper Volta to the port of Massawa on the Red Sea. This great and very ancient transcontinental highway—a good road in the west, excellent in Nigeria, but not so good in Chad and the west of the Sudan—probably played an important part in the spread of meningitis from its primary centers at the beginning of the century.

The Epidemic Cycles

A question that often has been asked, is whether waves of epidemics really exist, followed by periods of respite and then by fresh waves, or whether the epidemics are not merely periodic exacerbations of a persisting level of infection. A firm answer to this often asked question is difficult, if not impossible. All that can be said is that up to 1950, judging from the epidemiological reports, the theory of waves of epidemics sweeping from one country to another in a fixed direction was an acceptable one. Since 1950, however, there has been no real cycle of epidemics but instead, an endemic state with seasonal exacerbations, which forms a background for incidental epidemics of greater or lesser importance. This significant transformation of the epidemiology of meningitis in Africa is probably attributable to the action of immunity factors.

Laboratory Diagnosis

The laboratory diagnosis of meningitis caused by Neisseria meningitidis ordinarily presents no difficulties, except when the cerebrospinal fluid is clear. Clear cerebrospinal fluid may be found both in subclinical and abortive forms of the disease and in fulminating forms in which the cellular reaction has not had time to take place. Consequently, patients with a clear fluid in rural treatment centers should be given sulfonamides, especially if the clinical signs are marked, i. e., if neck rigidity is present along with increased pressure of the cerebrospinal fluid as measured by manometer.

Non-meningococcal Meningitis

Although, in Africa as elsewhere, meningitis is caused by meningococcus in the vast majority of cases, other organisms may be responsible. In a Chad village, for example, in 1945, there was an epidemic of pneumococcal meningitis secondary to pneumonia. In 1962, an even more curious epidemic occurred in the middle of the cool season among children of the village of Bissimafou, in the Republic of Chad, of a form of meningitis in which the cerebrospinal fluid was either cloudy or purulent. The author visited the spot, took samples of the fluid, and isolated 9 strains of a bacterium, which was possible to identify as Moraxella duplex. This organism, an inhabitant of the upper respiratory tract, had never been observed to cause meningitis, especially in epidemic form. This of course, is an isolated observation; but if further incidents of this kind should occur some of our ideas about meningitis with cloudy cerebrospinal fluid would have to be modified.

Clinical Aspects

Discussing the clinical aspects, Lapeyssonnie emphasizes the frequency, alongside the ordinary forms of meningitis with the classical symptoms, of meningoencephalitic forms characterized by one or more of the following features: coma of varying depth, epileptic or Jacksonian fits, or intractable psychomotor

agitation. These serious forms of meningitis, which are sometimes fulminating, are occasionally associated, as has been pointed out above, with a clear cerebrospinal fluid. They vary in frequency from one epidemic to another, but the proportion might be put at quarter or one-third of all cases.

Among neurological complications, cerebromeningeal hemorrhage was especially common in an epidemic affecting the town of Niamey in 1962. It is indicated by the presence of blood in, or xanthochromia of, the cerebrospinal fluid. Accurate information is lacking on the frequency of the Waterhouse-Friderichsen syndrome (adrenal hemorrhage) in Africa, but it may be surmised that—along with climatic stress—it plays an important part in mortality from meningitis in children.

While permanent sequelae to meningitis are relatively rare, the frequency of motor deficit, that resolves spontaneously after a period of variable length, is striking. Most often there is paralysis of the oculomotor muscles; more rarely there is hemiplegia or paraplegia. These complications—especially the lesions of the cranial nerves—particularly affect the young; 65% are found in the age group 0-14 years.

General Morbidity

In contrast to some transmissible diseases, such as influenza or measles, epidemics of which are massive and affect everyone in an age group at the same time, meningitis is essentially unpredictable. A case is notified here, a case there, at the beginning of the epidemic season; a village is affected, but notifies no more cases for several weeks; another village remains inexplicably free for several weeks, then, for no apparent reason is infected in its turn.

Treatment

In Africa the conditions of treatment in practice are very different from what they are in Europe and America. The vital thing is to treat patients on the spot, that is, in their homes, and to be able to employ an effective, simple, and—if possible—inexpensive method of treatment. This objective can be achieved for epidemic cerebrospinal meningitis by a single injection of sulfamethoxypyridazine. This form of treatment was tried out on a large scale in the Niger by the author and his collaborators in an epidemic in 1962 in which 14,776 cases were notified from 1 January to 30 May. A single injection of sulfamethoxypyridazine was given, as the only treatment, in 7,292 cases. This treatment was successful in 95% of 5,091 patients suffering from the ordinary form of meningitis and there were no sequelae; in 1%, a cure was obtained but with sequelae. The proportion of deaths among the cases with encephalitic complications was 15.2%, but here it must be stressed that in the majority death supervened within hours of the institution of treatment, which clearly had not had time to have effect. No accident occurred, no side effect of the drug was observed. In this connection, Lapeyssonnie points out that, because of the use of this drug, the mortality rate for meningitis in the Niger fell for the first time in its history to less than

10% (9.3% to be precise). The author thinks that results could be improved in the future if plastic syringes, ready for use, sterilized, containing the appropriate amount of sulfamethoxypyridazine for the age group of the patient (a characteristic silhouette might be shown on the syringe), and usable only once, were distributed not only to regional or rural dispensaries but also to anyone sufficiently trained to be able to give an intramuscular injection.

With regard to hospital treatment of meningitis, the author describes an interesting therapeutic trial carried out in 1961 on 1,915 meningitis patients at the Fort-Lamy Hospital, Chad. Several types of treatment were used: intramuscular sulfonamides alone (case fatality, 4.5%); sulfonamides plus a mixture of streptomycin and hydrocortisone acetate intraspinally (case fatality, 11%); sulfonamides plus intramuscular penicillin plus intraspinal streptomycin (case fatality, 5%); chloramphenicol plus sulfonamides, plus cortisone systemically, plus streptomycin intraspinally (case fatality, 5%). It is obviously difficult to assess results by merely taking the case fatality rate in each group into consideration, since the disease was not equally serious in the different groups; but it seems fairly clear that the most effective treatment is by sulfonamides alone. It is even worth asking if combinations of drugs are not more harmful than useful in children less than five years old.

The addition of cortisone and its derivatives to ordinary treatment with sulfonamides seems most appropriate when they can be administered in the first few days of the illness and the patient is in a marked toxic state. The author thinks that their use might be considered in the treatment of patients in temporary rural centers.

Prophylaxis

Since the rhinopharyngeal origin of meningococcal infection is generally admitted, individual prophylaxis is centered in the rhinopharynx. Several attempts at prophylaxis have been made, the most recent—and most interesting being that made in northern Nigeria in 1961 by Vollum & Griffiths², using 1 g of sulfonamide (sulfadimidine) powder intranasally. In the district of Danja, where there was an epidemic of meningitis, 99,017 of 100,000 or so inhabitants were given 1-4 doses (94% received 3 or 4 doses) of sulfonamide within a period of 2 days. The results were rather impressive. Whereas before prophylaxis there was an average of 70 cases of meningitis per week, for the 5 weeks immediately afterwards there were 34, 27, 17, 1, and 2 respectively. Further analysis disclosed that if the people absent when the prophylactic doses were being given were omitted, the actual figures would have been 13, 10, 3, 1, and 2. Although no definitive conclusions can be drawn from these facts, it seems reasonable to suggest that prophylactic trials should be carried out on an even larger scale.

Lapeyssonnie holds that key considerations are closely connected with the problem of carriers, which only systematic and patient research will one day succeed in solving.

2 Vollum, R. L. & Griffiths, P. W. W. J Clin Path 15(1): 50-53, Jan 1962



Did you know:

That the rate of diabetes among Hawaiians in Honolulu, on the Island of Oahu, is 6 times that of Caucasians, reports the J. A. M. A., 183: 419, 1963? (1)

That the total number of known cases of infectious hepatitis among persons associated with subhuman primates is now 78? Five cases are reported among people in contact with a newly-imported chimpanzee at the University of Oklahoma. (2)

That a downward trend in typhoid-paratyphoid mortality was already present before chlorination of water supplies became a widely accepted public health measure? It is interesting to note that a public water supply was first chlorinated in 1908.

Mortality rate fell from 31.3/100,000 population in 1900 to 0.016 in 1960. It is estimated that about 25,000 deaths in the United States were due to these diseases. In the last 3 years, the reported deaths have been less than 25 yearly—21 in 1960, 22 in 1959, and 23 in 1958. (3)

That the first case of naturally acquired human sparganosis (larval stage of fish tapeworm) is reported for New York State? The patient, a 43 year old white male, had noticed a migrating, itching subcutaneous nodule for 5 years prior to excision of the worm. Although he had been in Africa and Italy during World War II, the time of first appearance of the nodule strongly suggests that the parasite was acquired locally. In recent years his only travels were in the Buffalo area of New York and Canada, and his habit of drinking water from natural streams while on hunting trips could have led to the infection. (4)

That a new arbovirus in the Bunyamwera group has been isolated repeatedly from Anopheles crucians in Alabama and Florida in recent years? It has been named Tensaw virus after the river in Alabama where many of the infected mosquitoes were collected. The importance of this virus is still unknown. (5)

That the first identification of Pasteurella pestis in an Alaskan animal has been reported? The organism was obtained from a snowshoe hare found in the Matanuska Valley region. (6)

That for most people food to be eaten must be good food, and mere nutritiousness is not enough? In general, looking at the food of other cultures, it is the restriction of choice that is more striking, particularly when one fails to find the food one is used to.

Stefansson's Eskimos resented having to eat berries and vegetables, and did so only in times of dire necessity, rather than eat their dogs, the stage that immediately preceded cannibalism. Other cultures have even stronger taboos, e. g., beef is not appreciated in India, nor is pork in the Arab countries, nor is horse in the English-speaking countries. During World War II, in starving Malta, people threw away powdered eggs in the street rather than eat them. (7)

That marihuana can be grown in the United States? The hemp plant was grown in the United States before the Revolutionary War and was used to make rope for the square-rigged ships of the period.

Marihuana was first brought in large quantities into the southern part of the United States by Mexican laborers around 1910. It became established in New Orleans, from which it spread through the rest of the country. (8)

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- (7) World Health, Brit. Med. Jl., Vol 1, Page 515, 1962 (Taken from Current Med. Digest, A Williams & Wilkins Publication, May 1963)
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RESERVE**SECTION**

Navy Ensign, 1915 Medical Program
(continued)

Advantages and Opportunities

1. If you can meet the professional, educational, and physical requirements pertaining to this program, you may be appointed to commissioned status as Ensign 1915, U. S. Naval Reserve, for inactive duty while completing your medical studies. Ensigns 1915, are Naval Reserve officers on inactive duty in the fullest sense and are entitled to all the privileges commensurate with their rank and classification.
2. You are legally deferred from military service in accordance with the provisions of the Universal Military Training and Service Act, as amended, so long as you remain in good standing in medical school, or until graduation and completion of no more than twelve months internship.
3. Your period of active duty required by Selective Service legislation is performed as a medical officer with the U. S. Navy, which is presumed to be the service of your choice.
4. You may perform your period of obligated active duty, if any, immediately upon completion of internship instead of being subject to induction by the Selective Service System at a later date. If you do not participate in the Senior Medical Student Program you are eligible for consideration for deferment, upon individual request, to pursue residency training immediately upon completion of internship under the terms of a program (Berry Plan) administered by the Department of Defense.
5. You may associate with non-pay drilling units of the Naval Reserve while on inactive duty. In this manner, you gain valuable and worthwhile orientation and indoctrination into the naval service before entering on extended active duty. Moreover, you accrue promotion and retirement point credits.
6. In the event a naval internship is desired, you are given preferential consideration by the Department of the Navy in the selection of applicants for the Naval Intern Program.

7. You have the opportunity to compete for a Naval Research Clerkship or a Naval Clinical Clerkship described under separate headings in this article.
8. Upon acceptance for enrollment in the junior year of medical school, as an Ensign 1915, you are eligible to apply for the Navy's Senior Medical Student Program. Details concerning this program will be given in a continuation of this article.

Research Clerkship Training Program

1. Established as an active duty for training program at naval research activities, these clerkships provide orientation and indoctrination into medical research as well as on-the-job training for the undergraduate medical student during his vacation from medical school. Research clerkships offer a detailed review of the specific research program being conducted at the training activity. A part of the training will be spent in each research department. The trainee will serve as an assistant in actual laboratory research on one specific project under way at that time.
2. Research clerkships are of 30 to 60 days in duration and provide the full pay and allowances authorized while serving on active duty. Clerkships on an individual basis may be effected at any time during the fiscal year.
3. Eligible officers for research clerkships are medical students who are commissioned officers as Ensigns 1915. Applications for research clerkships should be submitted between February and May, when solicited by naval district commandants.
4. Research clerkships have been established at the following research activities:

Naval Medical Research Laboratory
U. S. Naval Submarine Base
New London, Connecticut

U. S. Naval Medical Field Research
Laboratory
Camp Lejeune, North Carolina

Aviation Medical Acceleration
Laboratory
Naval Air Development Center
Johnsville, Pennsylvania

Air Crew Equipment Laboratory
U. S. Naval Air Engineering Center
Philadelphia, Pennsylvania

Naval Medical Research Unit No. 4
U. S. Naval Hospital
Great Lakes, Illinois

U. S. Naval School of Aviation Medicine
Naval Aviation Medical Center
U. S. Naval Air Station
Pensacola, Florida

(continued on page 40)

U. S. Naval Experimental Diving Unit
U. S. Naval Station (Navy Yard Annex)
Washington, D. C.

U. S. Naval Medical Research Institute
National Naval Medical Center
Bethesda 14, Maryland

U. S. Naval Radiological Defense
Laboratory
San Francisco, California

Tissue Bank
U. S. Naval Medical School
National Naval Medical Center
Bethesda 14, Maryland

Surgical Research Laboratory
U. S. Naval Hospital
Chelsea, Massachusetts

Cardio Pulmonary Function Laboratory
U. S. Naval Hospital
St. Albans, New York

Naval Medical Research Unit No. 1
Life Sciences Building
University of California
Berkeley 4, California

Clinical Investigation Center
U. S. Naval Hospital
Oakland, California

Blood Processing Laboratory
U. S. Naval Hospital
Chelsea, Massachusetts

(to be continued)

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